

To: Rick Woodard, CALFED
Judy Heath, CALFED

From: Doug Morrison, USFWS
Tom Maurer, USFWS

Subject: USFWS Comments on Water Quality Implementation Plan Draft Outline

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USFWS recommends a three tiered approach to develop the Water Quality Program Implementation Plan (similar to ERPP Strategic Plan). CALFED should create a team from CALFED agencies to formulate the Implementation Plan (similar to the Interagency Development Team [IDT] for conveyance alternatives). Subteams could be formed to develop the components of the plan for each beneficial use (i.e., environmental, drinking water, etc). For example, the environmental water quality component subteam would have aquatic ecotoxicologists and ecologists from CALFED agencies (e.g., EPA, USFWS, USGS), and perhaps outside CALFED agencies (e.g., academia). This is tier one. An alternative approach is for the interagency team to act as a steering committee, and then assemble a drafting team with expertise in water quality protection/restoration planning and implementation from within and outside agencies. To be as unbiased and objective as possible the drafting team would not have members employed (directly or as consultants) by stakeholders; the approach used for ERPP strategic plan drafting team. The existing Water Quality Technical Group would provide additional technical expertise and review throughout plan development, and be an avenue for stakeholder input; this is tier two. An independent science/technical review panel would evaluate the draft plan (tier three). This panel would be composed of nationally recognized experts in water quality protection and restoration, but with no direct involvement in the bay-delta watershed to be as objective as possible. The independent review panel should be an ongoing process throughout the life of the Water Quality Program.

The plan should have a goals and objectives section. Objectives should be specific and quantifiable to the extent possible. Where objectives can not be quantified at the time, the necessary scientific/technical studies to do so should be identified in the Uncertainty section.

The plan should have a section describing key water quality attributes, hypotheses, and conceptual models. Key water quality attributes for the program should be identified. Examples of ecological water quality attributes include dissolved oxygen (water column and sediment), salinity, lack of biotoxicity in sediments and water, turbidity, and temperature. Hypotheses on the importance of these attributes to beneficial uses, the effects of human activities (stressors) on these attributes, and perhaps solution strategies should be stated.

Conceptual models describe links among the resources at risk; the key physical, chemical, and biological attributes of the ecosystem; and the effects of human activities (stressors) on these resources and attributes (NRC 1990). The hypotheses described above are the underlying basis for these models. By depicting cause-effect relationships regarding environmental changes, conceptual models help explain and justify water quality protection and restoration goals, objectives, and strategies. By focusing on these causal links, conceptual models help develop specific, testable hypotheses to explain why particular effects should or should not occur, to synthesize ideas and knowledge, identify supporting scientific information needs, identify logical errors, and develop performance indicators which can be used to evaluate program actions (NRC 1986). Most conceptual models are flow-type diagrams; however, matrices are also used to depict cause-effect relationships. Supporting descriptive text should accompany whatever diagrams are used. An example conceptual model for environmental water quality issues would be a risk assessment type conceptual model for ecotoxic contaminants. This model would show the links among contaminant source and stressors, resources at risk (key attributes), the effects of contaminants on these resources and attributes, and ecological indicators and measures.

Uncertainty Section: This section should identify scientific and technical information needs to support water quality protection and restoration implementation strategies and the adaptive management process, or at very least state the need and process for doing so. It may be better to title this section "Scientific Information Needs" or section "Addressing Uncertainty: Scientific Information Needs".

Adaptive Management Tools: The necessary scientific tools to support the adaptive management process, and generally the water quality protection and restoration program, are focused research, modeling, and monitoring. Modeling is missing from the outline. Mathematical predictive simulation models are an important scientific tool for the program. Examples include water quality models, nutrient dynamic models, ecotoxicology models (risk assessment, transport-fate, and bioaccumulation), and supporting hydrologic and hydrodynamic models. A modeling section describing modeling needs and evaluating existing models should be added to the plan.

The plan should have a section describing the relationship and integration of the Water Quality Program with the Ecosystem Restoration Program and other common CALFED programs.

References:

- National Research Council (NRC). 1986. Ecological Knowledge and Environmental Problem Solving: Concepts and Case Studies. National Academy of Sciences. Washington, D.C.
- National Research Council (NRC). 1990. Managing Troubled Waters: The Role of Marine Environmental Monitoring. National Academy of Sciences. Washington, D.C.